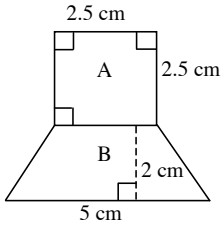
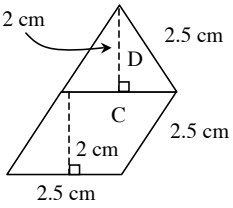
3-103. Manuel used Pattern Blocks to build the shapes below. The block marked "A" is a square, "B" is a trapezoid, "C" is a rhombus (a parallelogram with equal sides) and "D" is a triangle. Find the area of Manuel's shapes.

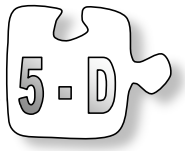
a.



b.



3.2.5 How can I solve it?



More Word Problem Solving

So far in Section 3.2, you have been using a 5-D Process as a way to organize and solve problems. Today you will continue using this process to solve problems in a variety of situations.

As you work, use the following questions to focus your team's discussion:

What is the problem asking?

What is the relationship between the quantities involved?

How can we decide which part of the problem to represent as x ?

What if a different quantity were represented with x?

3-104. According to many sources, insects are the most diverse group of animals on the planet. The number of species is estimated at between six and ten million and insects are said to represent more than half of all known living organisms and potentially over 90% of the differing life forms on Earth.

The following problems are about insects and other creepy crawly creatures. Use your math skills to find out some fascinating facts about them. Your teacher will assign your team one of the following problems to solve. Be prepared to present your solution, including all steps of your 5-D solving process, to the class.

a. Many insects migrate (travel) between their summer and winter homes. The Desert locust migrates about 800 miles farther than the Monarch butterfly every spring and the Pink-spotted hawkmoth migrates about 200 miles less than four times the distance of the Monarch butterfly every spring. Laid end to end, the distances traveled by a Monarch butterfly, a Desert locust, and a Pink-spotted hawkmoth is about 12,600 miles every spring. How far does each species travel?

b. Bees, wasps, and ants all live in colonies that have a queen. The queen of the colony is really the mother of all the insects in the colony. During the spring and summer, many eggs are laid in bee, wasp, and ant colonies all over the world. This is sometimes easy to see when there is a bee, wasp, or ant colony close to your house or school because there will be lots of these insects in the area.

Queen bees lay about double the number of eggs in a day that queen ants lay. Queen wasps lay about 600 fewer eggs a day than queen ants do. An average queen bee, ant, and wasp together lay about 2,600 eggs a day. How many eggs would each type of queen lay in one day?

c. Flies cannot see much past 24 to 36 inches, but that is not because they do not have lots of lenses in each eye. Dragonflies even have more! In one eye, dragonflies have two thousand more that seven times the number of lenses that houseflies have in one eye. If one housefly eye and one dragonfly eye together have 34,000 lenses, how many lenses do houseflies have in one eye? How many do dragonflies have in one eye?

Problem continues on next page. →

3-104. *Problem continued from previous page.*

d. Think you do not have enough room to farm? Think again. You could farm worms under your desk with a commercially available worm farm that measures 16" x 16" x 28". You can buy the worms online. At 1200 worms per pound you could start your own business just like John did. He's not good at keeping his records, however, and needs your help.

John buys his worms from two online stores, Worm Heaven and Wiggles R Us. John remembers that he ordered 1200 more than twice as many worms from Worm Heaven as he did from Wiggles R Us. He also knows he has 18,000 worms. How many worms did he order from each store.

e. There are many kinds of animals that live in and on our bodies, called parasites. Some of the longest parasites live in our intestines. Two of these parasites are roundworms and tapeworms. Their lengths can be quite different depending on how long they have been living in someone's body!

One of the longest tapeworms ever measured was three feet less than seven times the length of the longest roundworm ever measured. If you laid these two worms end to end, they would measure an amazing 69 feet! How long was the tapeworm and how long was the roundworm?

f. Did you know that most of the states in this country have official state insects and butterflies? Out of 30 states, the three most common insects are Monarch butterflies, honeybees, and ladybugs. The number of states that have Monarch butterflies as their official insect is one more than the number of states that have ladybugs as their official insect. The number of states that have honeybees as their official insect is three times the number of states with ladybugs as their state insect minus one. How many states have each kind of insect as their state insect?

Review & Preview

3-105. The number of girls at Middle School Cyber Summer Camp was six more than twice the number of boys. There were a total of 156 middle school students at the camp. Use the 5-D Process to find the number of boys and the number of girls at camp.

3-106. The daily high temperatures in degrees Fahrenheit for the last two weeks in Grand Forks, North Dakota were: 7, 1, –3, 0, 4, –1, 2, 5, 7, 7, 3, –2, –4, –5.

a. Calculate the mean temperature.

b. Calculate the mode of the data.

c. Calculate the median temperature.

d. Which measure of central tendency do you think best represents the weather in Grand Forks? Why?

3-107. On graph paper, graph the shape that has coordinates $(-2,-1)$, $(1,2)$, and $(-2,3)$.

a. Predict the coordinates of the shape after it is translated three units to the right and one unit down. Check your prediction on the graph.

b. Dilate the original shape by multiplying both the x- and y-coordinates by 2.

c. Reflect the original shape over the y-axis. What are the new coordinates?

3-108. Which expressions are equivalent to the perimeter of the shape? How do you know?

a. $x+3+3x+1$ b. $2x+4+x$

c. $4x+4$ d. $2x+2+2x+2$